

# C28, Cylindrical Plastic Case, Segmented Film

## 420 VAC/470 VAC

### Overview

The C28 capacitor is a polypropylene metallized segmented film capacitor with a cylindrical, plastic can-type design filled with resin. It uses faston and plastic deck, or cable terminals.

### Applications

Typical applications include motor run S3 safety class: single-phase motors, low power electric motors, and compressors.

### Benefits

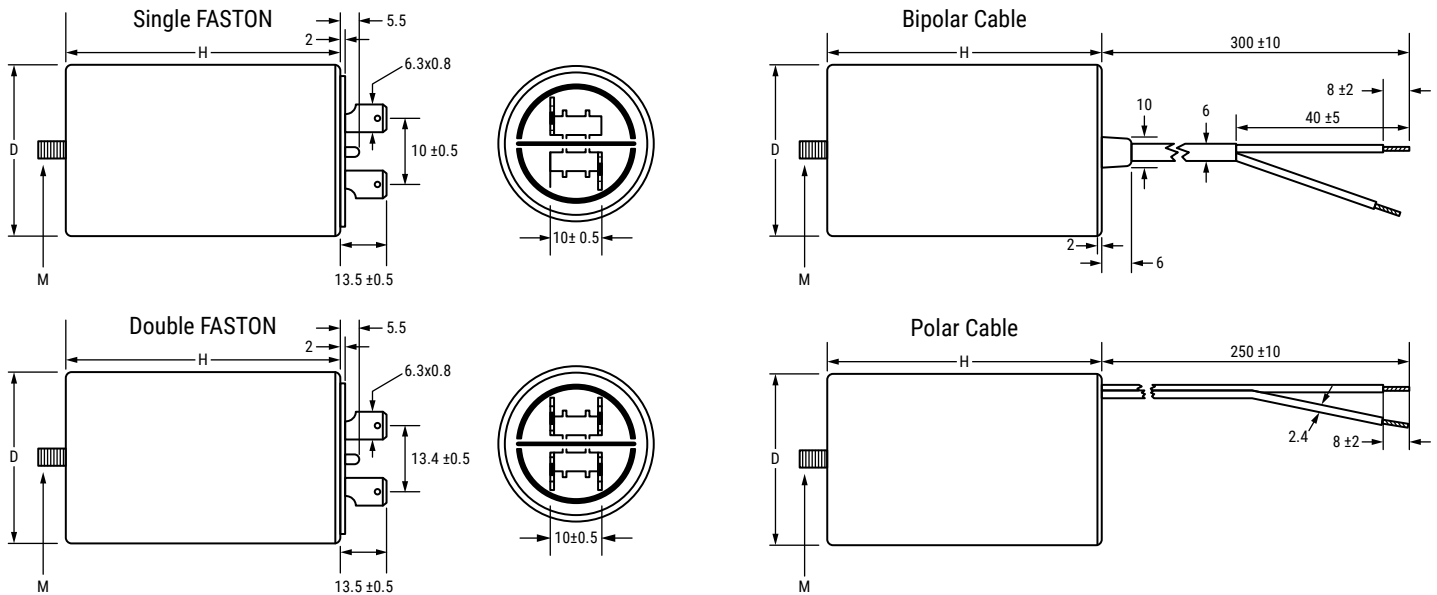
- Self-healing
- IMQ approved
- Rated frequency of 50 Hz and 60 Hz
- High capacitance density
- Safety protection



### Part Number System

C28	4	A	C	A	4300	AL	0	J
Series	Marking	Case and Fixing Bolt Code	Terminal Style	Capacitance Code (pF)	Packaging	Internal Use	Tolerance	
C28 = Motor Run Capacitors	4 = 30,000 hours/420 VAC (Class A) or 10,000 hours/470 VAC (Class B)	C284: A = Standard	A = Without fixing bolt/flat bottom C = Cylindrical plastic case with M8 bolt D = Quick fit	2 = Single FASTON 6.3 x 0.8 3 = Double FASTON 6.3 x 0.8 A = Unipolar flexible cable (tinned end) B = Unipolar flexible cable (untinned end) F = Bipolar cable (tinned end) R = Unipolar rigid cable (tinned end)	Digits two – four indicate the first three digits of the capacitance value. First digit indicates the number of zeros to be added.	AA = FASTON terminals standard AL = Unipolar cable L = 300 mm, stripped 8 mm LF = Bipolar cable L = 250 mm unsheathed 40 mm, stripped 8 mm LH = Bipolar cable L = 350 mm unsheathed 40 mm, stripped 8 mm	0, 1, 2, 5 = Standard	J = 5%

## Dimensions – Millimeters



D	H	Mounting Stud (M)
+1/-0	±2	
25	56.5	M8 x 10
25	58	M8 x 11
25	55	M8 x 12
25	58.5	M8 x 13
25	57	M8 x 14
30	56.5	M8 x 15
30	55	M8 x 16
30	69.5	M8 x 17
30	58.5	M8 x 18
30	57	M8 x 19
35	56.5	M8 x 20

D	H	Mounting Stud (M)
+1/-0	±2	
35	73.5	M8 x 21
35	55	M8 x 22
35	57	M8 x 23
35	71.5	M8 x 24
35	74	M8 x 25
35	69.5	M8 x 26
35	58.5	M8 x 27
40	73.5	M8 x 28
40	71.5	M8 x 29
40	74	M8 x 30
40	69.5	M8 x 31

## Qualifications

Reference Standards	IEC 252, EN 60252-1:2011/A1/2013, IMQ
Vibration Test	IEC 68-2-6

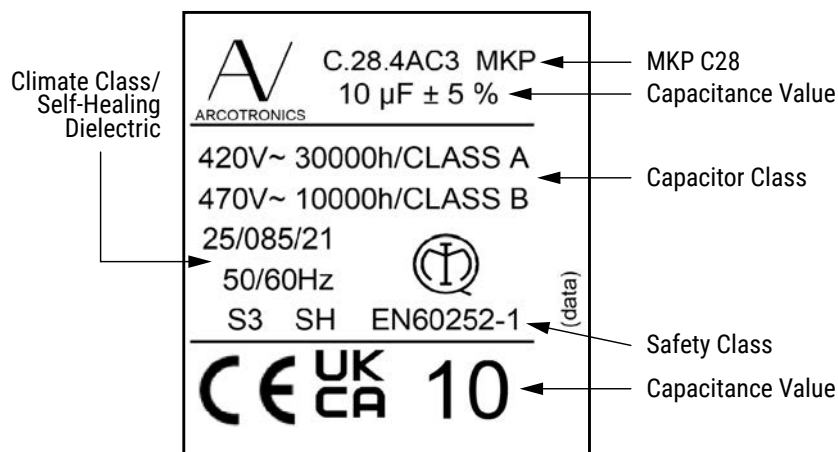
## Performance Characteristics

Type of Service	Continuous
Operating Class	
C284	Class A 30,000 hours at 420 VAC or Class B 10,000 hours at 470 VAC
Temperature Range	-25°C to +85°C
Storage Temperature	-40°C to +90°C
Rated Voltage	470 VAC
Rated Frequency	50 – 60 Hz
Voltage Rise/Fall Time (Maximum)	20 V/μs
Maximum Permissible Voltage	1.10 x rated voltage
Maximum Permissible Current	1.30 x rated current
Dissipation Factor (DF)	$20 \times 10^{-4}$ at +20°C, 50 Hz
Safety Class	S3
Maximum Altitude	2,000 m
Capacitance Tolerance	±5%
Mounting	Any position
Can	Polypropylene with self-extinguishing features V2 (UL 94) Noryl with self-extinguishing features VI (UL 94) for diameters > 50 mm
Disk	FASTON execution: Nylon PA66 with self-extinguishing features V0
	Cable execution: PC-A with self-extinguishing features V0
	For diameters > 40 mm cable execution: Noryl PPO with self-extinguishing features VI
Filling Resin	Epoxy
Dielectric	Polypropylene
Plates	Self-healing metal layer
Test Voltage Terminal to Terminal (VTT)	$2 V_n$ for 2 seconds
Test Voltage Terminal to Can (VTC)	2,000 V for 2 seconds
Air Distance Between Live Parts	≥ 5 mm
Air Distance Between Live Parts and Case	≥ 6 mm

**Table 1 – Ratings & Part Number Reference**

Capacitance Value (µF)	VAC	Maximum Dimensions (mm)		dV/dt (V/µs)	Termination	Packaging Quantity	Part Number
		D	H				
2	470	25	55	20	Unipolar flexible cable (tinned end)	162	C284ACA4200AL0J
2.5	470	25	55	20	Unipolar flexible cable (tinned end)	162	C284ACA4250AL0J
3	470	25	55	20	Unipolar flexible cable (tinned end)	162	C284ACA4300AL0J
4	470	30	55	20	Unipolar flexible cable (tinned end)	110	C284ACA4400AL0J
5	470	30	55	20	Unipolar flexible cable (tinned end)	110	C284ACA4500AL0J
6	470	30	69.5	20	Unipolar flexible cable (tinned end)	110	C284ACA4600AL2J
3	470	25	55	20	Unipolar rigid cable (tinned end)	162	C284ACR4300AL0J
8	470	30	69.5	20	Unipolar rigid cable (tinned end)	110	C284ACR4800AL2J
10	470	35	69.5	20	Unipolar rigid cable (tinned end)	86	C284ACR5100AL0J
Capacitance Value (µF)	VAC	B (mm)	H (mm)	dV/dt (V/µs)	Termination	Packaging Quantity	Part Number

**Marking**



(data): Manufacturing Plant, Date Code, Day of Production, Internal Mark

## Marking cont.

Manufacturing Date Code (IEC-60062)			
Year	Code	Month	Code
2020	M	January	1
2021	N	February	2
2022	P	March	3
2023	R	April	4
2024	S	May	5
2025	T	June	6
2026	U	July	7
2027	V	August	8
2028	W	September	9
2029	X	October	0
2030	A	November	N
2031	B	December	D
2032	C		
2033	D		
2034	E		
2035	F		
2036	G		
2037	H		
2038	J		
2039	K		
2040	L		

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All KEMET power film capacitors are RoHS compliant.

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## Dissipation Factor

Dissipation factor is a complex function involved with capacitor inefficiency. The  $\tan \delta$  may vary up and down with increased temperature. For more information, refer to Performance Characteristics.

## Sealing

### Hermetically Sealed Capacitors

As the temperature increases, the pressure inside the capacitor increases. If the internal pressure is high enough, it can cause a breach in the capacitor. Such a breach can result in leakage, impregnation, filling fluid, or moisture susceptibility.

### Barometric Pressure

The altitude at which hermetically sealed capacitors are operated controls the capacitor's voltage rating. As the barometric pressure decreases, the susceptibility to terminal arc-over increases. Non-hermetic capacitors can be affected by internal stresses due to pressure changes. These effects can be in the form of capacitance changes, dielectric arc-over, and/or low insulation resistance. Altitude can also affect heat transfer. Heat that is generated in an operation cannot be dissipated properly, and high RI2 losses and eventual failure can result.

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